IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,

Plaintiff,

vs. 4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,

Defendants.

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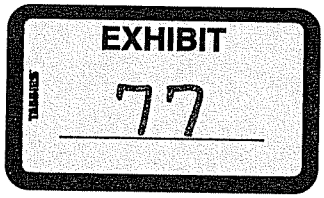
VOLUME II OF THE VIDEOTAPED DEPOSITION OF INDRAJEET CHAUBEY, PhD, produced as a witness on behalf of the Plaintiff in the above styled and numbered cause, taken on the 2nd day of March, 2009, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Lisa A. Steinmeyer, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.



Q A considerable amount of it is unshaded areas; would you agree?

MR. BOND: Object to form.

MS. TUCKER: Object to form.

MS. LONGWELL: Object to form. 09:34AM

A Yes.

Q Based on the studies we've talked about and the published literature, your experience and education, do you have an opinion whether there is sufficient evidence to establish that phosphorus is 09:35AM transported, phosphorus and nitrogen is transported from waste-applied fields in runoff to the waters of the Illinois River watershed?

MS. TUCKER: Object to form.

MR. BOND: Object to form.

MS. TUCKER: Object to form.

MR. FREEMAN: Object to form.

MS. LONGWELL: Object to form. Calls for an undisclosed expert opinion.

A Yes. 09:35AM

Q What is your opinion?

MR. BOND: Same objection.

MS. HILL: Objection.

MS. TUCKER: Same objection.

MS. LONGWELL: Object to form. 09:35AM

MR. FREEMAN: Object to form.

A Phosphorus is transported from the areas which are treated with poultry litter.

Q Are you, sir, the only one in the scientific community to draw such a conclusion? 09:35AM

MS. LONGWELL: Object to form.

MS. TUCKER: Object to form.

MS. HILL: Object to form.

A No, I am not. Number of studies have been published. 09:36AM

Q And are those very recent studies or are they of some vintage, if you will?

A There were studies in '80s and '90s before I started looking at it, early '90s before I started looking at it. 09:36AM

Q All right. Can you tell the court the names of some authors that you're aware of that have drawn similar conclusions that you've just told us about today?

A Dwayne Edwards or D. R. Edwards has done lots of studies in this area. Dr. Tommy Daniel or T. C. Daniel. Dr. Andrew Sharpley. Dr. Tom Simms, I believe he's a professor somewhere in the Delmarva Peninsula area. He has published. There has been a number of studies. 09:36AM 09:37AM

Q Do you recall generally how those differences -- what they are, what you observed when you tested both?

A It has been a while since I published those.

Q It's not a memory test. If you don't remember, that's fine. 09:41AM

A Yeah.

Q Okay. Have you seen any studies or published materials that concern poultry waste from different bird types would act any different than poultry litter or manure from broilers let's say? 09:41AM

MS. HILL: Object to form.

A Ask the question one more time.

Q Have you seen any studies or published materials concerned with poultry waste from different bird types indicating that it would act different than poultry from broilers, poultry waste? 09:41AM

MS. HILL: Same objection.

A So generally speaking the amount of -- there will always be some losses taking place from the areas treating with -- treated with the poultry waste. The level of magnitude may be different depending upon the consistency and the physical chemical characteristics of the sources. 09:42AM

Q I'm going to hand you Exhibit No. 6, Dr. 09:42AM

cites Green and Haggard in 2001. Did you review that study?

A I have seen Green and Haggard 2001 study.

Q And is that one of the studies you talked about that had drawn similar conclusions as this study? 09:51AM

A Uh-huh.

Q Would that be a yes?

A Yes.

Q Thank you.

A I'm sorry.

Q In your opinion, Dr. Chaubey, is there a correlation between high STP levels and rates of poultry waste manure or poultry litter application?

MS. TUCKER: Object to form. 09:52AM

MR. BOND: Object to form.

Q Let me restate it. Based upon your knowledge, experience and expertise in this area, is high STP levels in soil an indicator of poultry waste application rates in excess of plant requirements? 09:52AM

MS. TUCKER: Same objection.

MR. BOND: Object to form.

MS. HILL: Object to the form.

MS. LONGWELL: Object to form. Calls for an undisclosed expert opinion. 09:52AM

A Yes.
Q What do you base your opinion on?
MS. LONGWELL: Same objection.
A There have been a number of published studies that indicate that if you apply animal manure, including poultry litter, in excess of what is needed by plants, then phosphorus would accumulate over time and that would be indicated as high STP. 09:53AM
Q Dr. Chaubey, can losses of nutrients occur from fields that are low in STP? 09:54AM
MS. TUCKER: Object to form.
MS. LONGWELL: Object to form.
A Yes.
Q And how is that; why does that occur?
MS. LONGWELL: Same objection. 09:55AM
A Runoff when it interacts with the soil, it will pick up nutrients, including phosphorus, from the soil column if any amount of phosphorus is present there. The level of magnitude may be different depending upon the STP. That's why you see some amount of phosphorus coming from entirely forested areas, which may have very, very low STP values. 09:55AM
Q Let's kind of change the subject a little bit. Are you familiar with what's referred to as the 09:56AM

MR. FREEMAN: Object to form.

MS. LONGWELL: Object to form.

A That is generally true.

Q Okay. Based on your knowledge, skill, education, training and experience, including knowledge of published literature, do you have an opinion if the land application of poultry waste has contributed a substantial amount, that is, more than de minimis, of nutrients to the Illinois River and its streams? 10:19AM

MS. HILL: Object to form.

MS. LONGWELL: Object to form. Calls for an undisclosed expert opinion.

A Yes.

Q And what is that opinion? 10:19AM

MS. LONGWELL: Same objection.

A So we did the mass balance study and then looked at a number of other published studies in this watershed. Poultry litter is the biggest source of nutrients when you look at all the 10:20AM sources, and given that fact and given the fact that it runs off the fields, it will be logical to conclude that significant amount of phosphorus in the river is coming from the areas that are treated with poultry litter. 10:20AM

MR. GARREN: Object to form.

A For a watershed assessment using GLEAMS or any other field scale model, you need to interface that or you need to have a routing model that goes with it, and that's one way you can do a watershed scale assessment, and it's done all the time. 11:29AM

Q Huh?

A It's done all the time by a number of modelers using GLEAMS and other field scale models.

Q Okay, but the routing model is very important? 11:30AM

MR. GARREN: Object to form.

A Yes.

Q Okay. I can't remember how this was stated in your first deposition, but do you hold the opinion that if you apply poultry litter over the agronomic rate, that it's waste disposal? 11:30AM

A I do.

Q You do?

A Yes.

Q Okay. What are you -- with respect to the agronomic rate, what nutrient are you looking at; are you looking at every nutrient in poultry litter or are you just looking at phosphorus? 11:30AM

A I am looking at both nitrogen and phosphorus because those are the two micronutrients of water 11:30AM

quality concern that I have been studying.
Q Okay, but whatever else is in there that's beneficial to the soil, you're not looking at that?
MR. GARREN: Object to form.
A It may be important, but in my studies I'm not concerned. 11:31AM
Q Okay. Okay. So if you use litter above the agronomic rate for phosphorus or nitrogen and -- hold on. Strike that. If you use -- if a farmer uses litter above the agronomic rate, are you talking about an instance where none of the nutrients in the litter are needed for the soil or all? 11:32AM
MR. GARREN: Object to form.
Q It's a bad question. I'm having a hard time formulating it but -- 11:32AM
A I'm not able to understand it either.
Q But if we're at -- if the soil test phosphorus is at, you know, let's say 160 and they apply poultry litter, are you saying in that instance that it's waste disposal? 11:32AM
A Yes.
Q Okay. Tell me why that's waste disposal.
A Because assuming you are growing fescue or Bermuda on that soil, which is the case here in the 11:32AM

Illinois River watershed, there is sufficient amount of phosphorus of a level already in the soil to support the plant growth. It does not need any more phosphorus. Therefore, applying any additional phosphorus is a disposal. 11:33AM

Q Okay. So is it a disposal of phosphorus because what if the grass needs nitrogen?

MR. GARREN: Object to form.

A It is true that grass needs nitrogen, and nitrogen may be supplied by other forms of 11:33AM fertilizer that does not have phosphorus into it.

Q Okay. What if the crop needs potassium?

A The same answer would hold true. Why -- why would you apply a nutrient that is not needed?

Q What if it needs two out of three nutrients 11:34AM that are found in poultry litter; is it waste disposal?

MR. GARREN: Object to form.

A It is -- it is a waste disposal given the environmental concerns and given the fact that 11:34AM phosphorus is a limiting nutrient in freshwater systems. So when present in excess, you get eutrophication, so it is a waste disposal.

Q It seems to me that under your theory, something can be waste disposal as well as 11:34AM

agronomically beneficial. Do you agree with that?

MR. GARREN: Object to form.

A I don't understand your logic here.

Q Okay. From an environmental perspective, you believe that applying phosphorus when it's not needed by the grass is waste disposal; correct? 11:35AM

A Yes.

Q Okay. Let's say that grass needs nitrogen and potassium but doesn't need phosphorus. The application of that poultry litter would be agronomically beneficial from a nitrogen and potassium standpoint; correct? 11:35AM

A Application of nitrogen and potassium will be beneficial to the grass. How you are meeting that need defines whether you are disposing of waste or not. If you are meeting that through inorganic fertilizers, which does not have phosphorus present, therefore, you are not putting any more phosphorus on the land than what is needed, is different from applying it through animal manure or triple 16, right, it's -- I believe that's one of the combinations of inorganic fertilizer, 16 percent nitrogen, 16 percent phosphorus, 16 percent potassium is present, but it also is fertilizer disposal at the best because are putting something 11:35AM 11:36AM 11:36AM

that is not needed for the plant growth.

Q Okay. In your work in the Eucha-Spavinaw watershed and your familiarity with the ESPI, does ESPI allow litter application on fields that are above the agronomic rate for any single nutrient, such as phosphorus? 11:36AM

A It looks at different risk alternatives, and it allows litter application under low or medium risk. It has been a while since I reviewed that table, but I believe it does allow litter application above strictly agronomic rates. 11:37AM

MR. BOND: Let's go off the Record.

VIDEOGRAPHER: We are off the Record at 11:37 a.m.

(Following a lunch recess at 11:37 a.m., proceedings continued on the Record at 12:52 p.m.) 11:37AM

VIDEOGRAPHER: We are now on the Record. The time is 12:52 p.m.

CROSS EXAMINATION

BY MS. TUCKER:

Q Dr. Chaubey, I'm K. C. Tucker and I represent the George's defendants in this matter. I apologize in advance. I'm going to jump around quite a bit. If at any point I'm unclear, let me know and I'll do 12:50PM